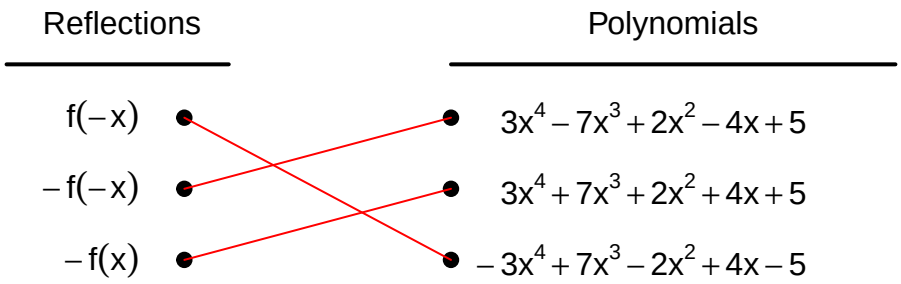
Name: Date:

Exam: Function Reflections (Solution version 27)

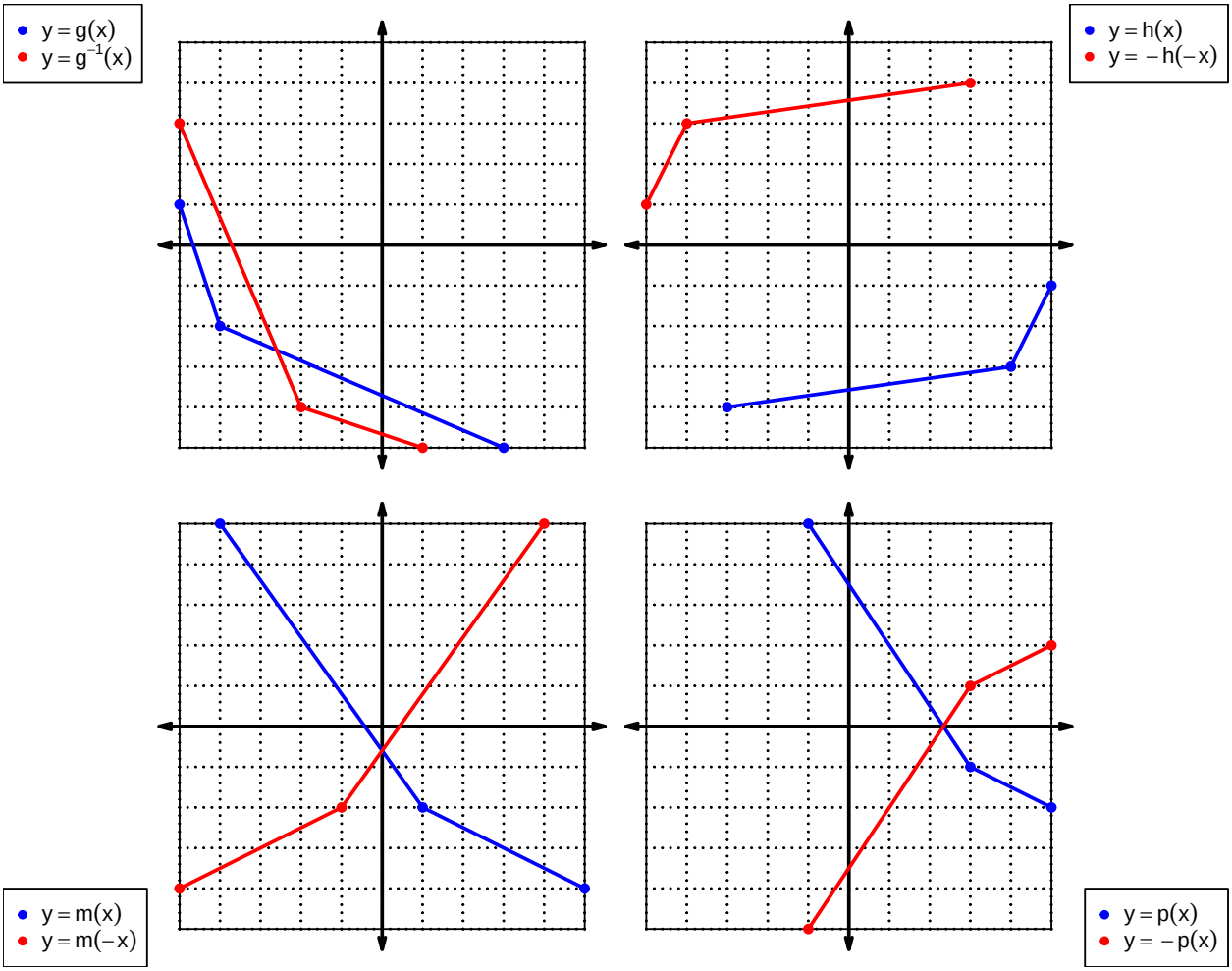
1. Let function f be defined by the polynomial below:

$$f(x) = -3x^4 - 7x^3 - 2x^2 - 4x - 5$$

Draw lines that match each function reflection with its polynomial:



2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	9	9	7
2	8	1	4
3	6	5	1
4	1	3	3
5	2	4	8
6	7	8	5
7	5	6	2
8	4	7	9
9	3	2	6

3. Evaluate $f(3)$.

$$f(3) = 6$$

4. Evaluate $g^{-1}(2)$.

$$g^{-1}(2) = 9$$

5. Assuming g is an **odd** function, evaluate $g(-4)$.

If function g is odd, then

$$g(-4) = -3$$

6. Assuming h is an **even** function, evaluate $h(-7)$.

If function h is even, then

$$h(-7) = 2$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

$$p(x) = -x^2 + 1$$

   a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^2 + 1$$
$$p(-x) = -x^2 + 1$$

   b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -\left(-x^2 + 1\right)$$
$$-p(-x) = x^2 - 1$$

   c. Is polynomial p even, odd, or neither?

   even

   d. Explain how you know the answer to part c.

   We see that $p(x) = p(-x)$ for all x because $p(x)$ and $p(-x)$ are equivalent polynomials. Thus function p satisfies the criterion for being an even function.

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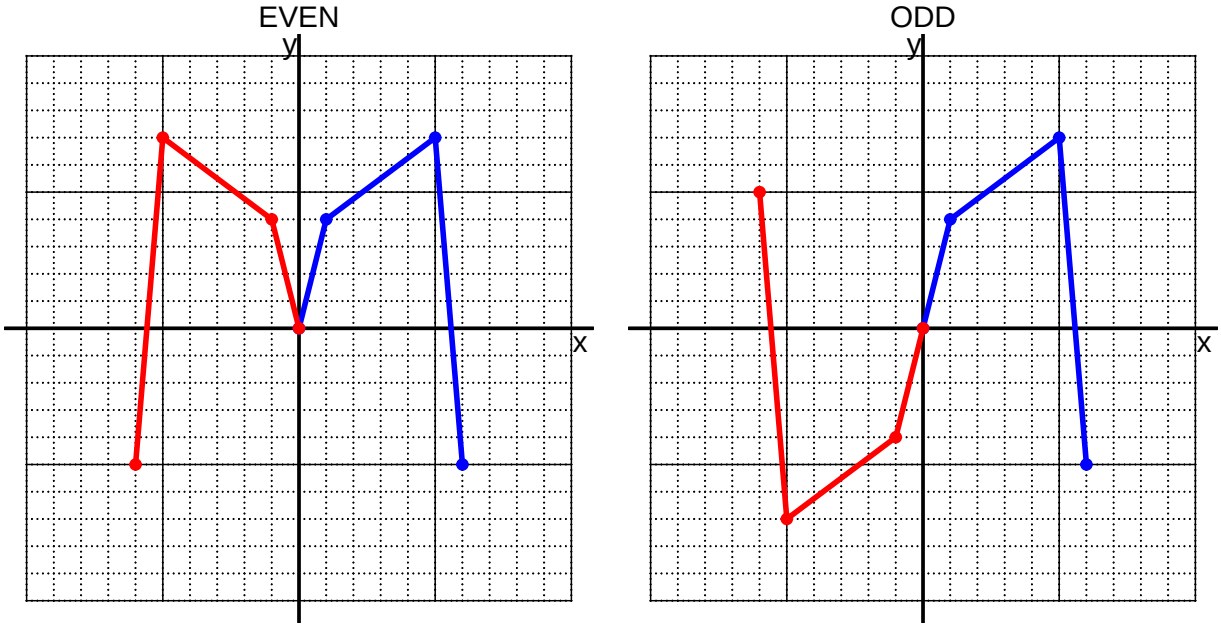
8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = \frac{x}{3} + 9$$

a. Evaluate $f(24)$.

step 1: divide by 3
step 2: add 9

$$f(24) = \frac{(24)}{3} + 9$$
$$f(24) = 17$$

b. Evaluate $f^{-1}(35)$.

step 1: subtract 9
step 2: multiply by 3

$$f^{-1}(x) = 3(x - 9)$$
$$f^{-1}(35) = 3((35) - 9)$$
$$f^{-1}(35) = 78$$

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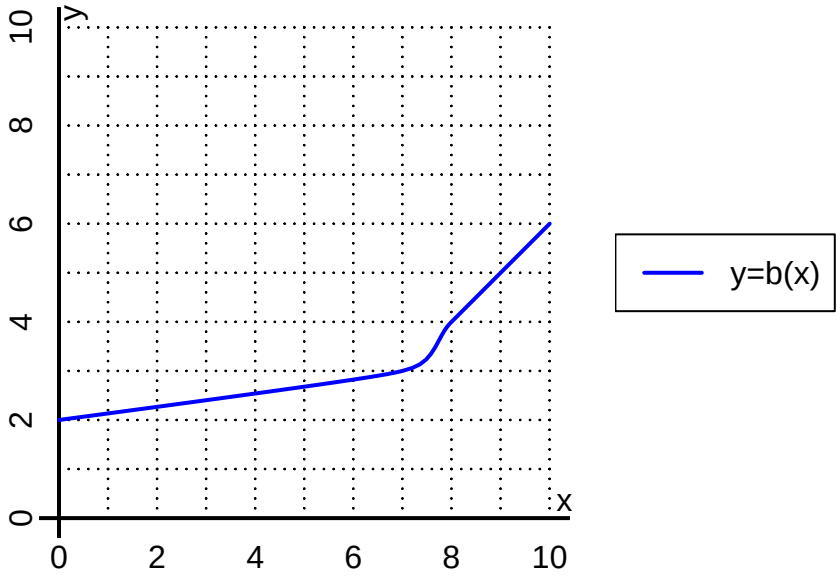
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(8)$.

$b(8) = 4$

b. Evaluate $b^{-1}(3)$.

$b^{-1}(3) = 7$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	6	-6	6	-6
-1	4	-4	-4	4
0	0	0	0	0
1	-4	4	4	-4
2	6	-6	6	-6

b. Is function f even, odd, or neither?

neither

c. How do you know the answer to part b?

Function f is neither because neither column $-f(-x)$ nor column $f(-x)$ matches column $f(x)$ exactly.